

## **REMARKS**

The above amendments and these remarks are responsive to the Office action mailed May 13, 2005. With entry of this amendment, Claims 1-8, 10-14, and 16-25 are pending. Claims 22 and 23 are allowed. Claims 1, 6, 8, 11, 17, 21, and 24 have been amended. No new matter has been added by these amendments.

Applicants thank the Examiner for his consideration of the application. In the Office action, the drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because controller 12 mentioned in the description is not designated in Figure 1 and Figure 3 is not labeled as "Prior art." Claims 1, 3, 5-8, 10-14, 21, 24, and 25 are rejected under 35 U.S.C. § 102(b) as being anticipated by Inoue et al. (U.S. Patent 4,152,570). Claims 1-3, 5, 11, 12, 14, 17, 18, 20 and 24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Guerin et al. (EP 1174595 A1) in view of Inoue et al. Claims 4 and 16 are rejected under U.S.C. § 103(a) as being obvious over Inoue et al. Claim 19 is rejected under U.S.C. § 103(a) as being obvious over Inoue et al.

Applicants respectfully traverse the rejections, but nevertheless amend the claims as indicated above. In view of the remarks below, and the amendments above, Applicants respectfully request reconsideration of the application under 37 C.F.R. § 1.111 and allowance of the pending claims.

## **Drawings**

The drawing are objected to as failing to comply with 37 CFR 1.84(p)(5) because Figure 1 does not designate controller 12 which is mentioned in the description and Figure 3 is not labeled as "Prior art."

Replacement sheets are included herewith designating controller with reference sign “12” and labeling Figure 3 as showing performance of the “Prior Art.”

**Claim Rejections Under 35 U.S.C. § 102**

**Claim 1, 3, 5-8, and 10**

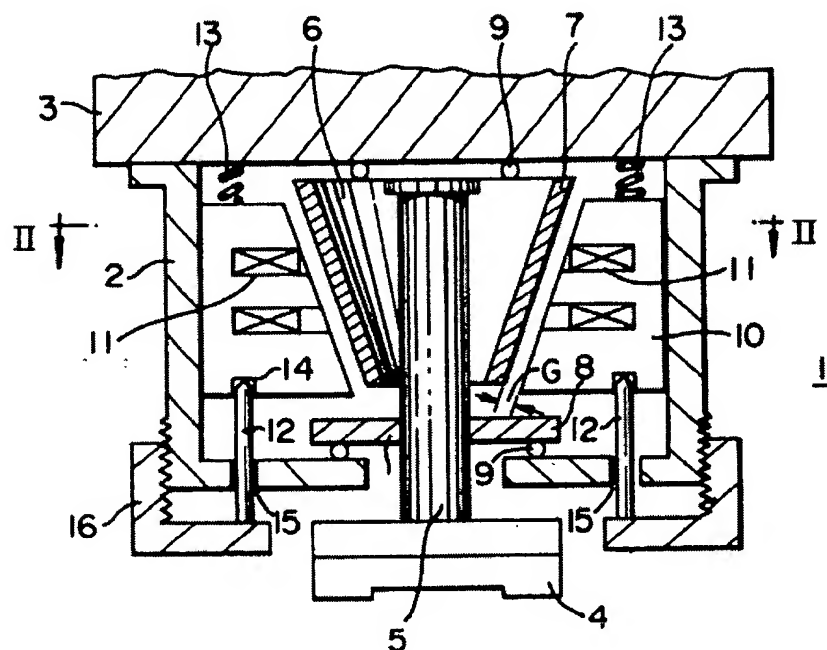
The Office action first asserts that there are two preambles in Claim 1. Applicants submit that only a single preamble is presented (“A system, comprising”), and that the remainder of Claim 1 represents the body, where the remainder of the claim includes “a valve actuator” having various elements. However, to address any potential confusion, Applicants have amended claim 1 so that the body of claim 1 includes a valve actuator “including” various elements. Please note that this change should not be understood to change the open ended nature of the claim as a whole, or the open ended nature of the valve actuator.

Claims 1 was also rejected under 35 U.S.C. § 102(b) as being anticipated by Inoue et al. Applicants respectfully traverse the rejection.

First, as stated in Applicants previous response, Inoue et al. is simply inapplicable to claim 1. Inoue et al. relates to a “tool electrode for the electrical machining of a workpiece.” See the abstract. Claim 1 clearly requires “a valve actuator coupled to a valve of an internal combustion engine.”

Second, the Office action relies on disk plate 8 as extending axially through the core 10, where the movement of the disk plate is parallel to an axis of the coil windings. Even assuming disk 8 moves co-axially with the windings of coil 11, Applicants respectfully submit that neither disk 8 nor shaft 5 extends axially *through* a core and within a coil. As shown by Figure 1 of

Inoue et al., reproduced below, disk 8 and shaft 5 extend along sides of core 10, not axially through a core, and not through any of coils 11A-D.



Third, the Office action relies on Inoue et al. to show a permanent magnet extending at least partially into an interior portion of the coil. However, Figure 1 of Inoue et al. shows that magnet layer 7 is located entirely outside the four coils 11A-D. Thus, Applicants respectfully submit that Inoue et al. fails to show piece 7 extending at least partially into an interior portion of the coil.

Therefore, Applicants respectfully request that the rejection under 35 U.S.C. § 102(b) be withdrawn.

#### Claims 11-14

Claims 11-14 are rejected under 35 U.S.C. § 102(b) as being anticipated by Inoue et al. Claim 11 includes a permanent magnet located at least partially inside a coil. As described above, Inoue et al. shows magnet 7 located entirely outside of coils 11A-D.

As Claims 12-14 are dependent on Claim 11, Applicants respectfully traverse the rejections for at least the reasons cited above.

Applicants respectfully request the rejections be withdrawn.

#### Claim 21

Claim 21 is rejected under 35 U.S.C. § 102(b) as being anticipated by Inoue et al.

Applicants respectfully submit that Inoue et al. admittedly fails to anticipate Claim 21 since the Office actions fails to even allege that Inoue et al. shows a valve actuator coupled to a valve of an internal combustion engine.

Applicants respectfully request this rejection be withdrawn.

#### Claims 24-25

Claims 24-25 are rejected under 35 U.S.C. § 102(b) as being anticipated by Inoue et al. Claim 24 specifies that the “permanent magnet means is located at least partially within said coil.” As noted above, the permanent magnet 7 of Inoue et al. is entirely outside coils 11A-D.

Thus, Applicants respectfully request this rejection be withdrawn.

#### **Claim Rejections under 35 U.S.C. § 103**

##### Claims 1-3, 5, 11, 12, 14, 17, 18, 20, and 24

Claims 1-3, 5, 11, 12, 14, 17, 18, 20, and 24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Guerin et al. in view of Inoue et al. Applicants respectfully disagree and respectfully submit that one skilled in the art would be discouraged from even attempting to combine features from Inoue et al. with those of Guerin et al.

Inoue et al. is simply inapplicable to the engine valve actuation of Guerin et al. since Inoue et al. relates to a “tool electrode for the electrical machining of a workpiece.” See the abstract. The skilled person would also see the electromagnet design of Inoue et al. as unacceptable for valve actuation of internal combustion engines for numerous reasons. As one example, Inoue et al. places the permanent magnet (PM) on the moving part, i.e. the armature. If one applied such a system to engine valve actuation according to the prior art, it would provide degraded results since the added mass of the armature would severely restrict the ability to rapidly open and close the valve during engine operation.

Another shortcoming of the asserting combination is that the references show directly contradictory configurations for armature movement relative to a coil winding axis. Specifically, the axis of the coil windings is perpendicular to the movement of the armature in Guerin et al. while the axis of the coil windings is allegedly parallel to the movement of the armature in Inoue et al. Furthermore, neither reference gives any hint of how to reconcile these disparate teachings.

These are but a few of the many reasons why the combination of Guerin et al. with Inoue et al. must fail.

#### Claims 4, 16, and 19

Claims 4 and 16 are rejected under U.S.C. § 103(a) as being obvious over Inoue et al. The Office action asserts that various features are obvious and asserts that “there is nothing in the record which establishes that the application of such a cross-section or layering represents a novel or unexpected result,” citing *In re Kuhle*. Office action, page 6. It further asserts that “there is nothing in the record which establishes that the combination of cam actuated and electromagnetically actuated valves represent a novel or expected result.” Office action, page 7.

Applicants respectfully disagree with these statements and submit that there is a lack of any evidence to support the conclusions of obvious.

For example, the V-shape configuration is described in Applicants' specification as increasing the flux density in the core pole as compared with a permanent magnet having a flat cross-section. *See* lines 11-12 on page 2 of the specification, for example. Furthermore, an advantage of a permanent magnet that includes multiple layers is increased the flux density. Finally, an example advantage of using both electrically actuated valves and cam actuated valves is the ability to obtain variable control of engine airflow with electrically actuated intake valves, without requiring electrically actuated valves in the exhaust.

Finally, Applicants object to assertions in the Office action as not supported by any evidence in the record.

Applicants respectfully request the rejection be withdrawn.

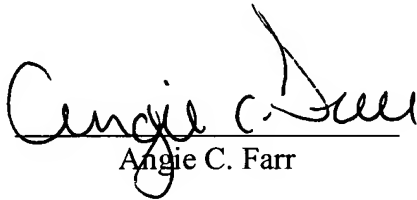
### **Conclusion**

Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and such allowance is courteously solicited. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is courteously requested to contact the undersigned by fax or telephone at the number listed below.

Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account No. 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505.

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as express mail number EV 700316463US in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on August 15, 2005.

  
Angie C. Farr

Respectfully submitted,

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**Amendments to the Drawings**

Attached are two replacement sheets of drawings for Figures 1, 2, and 3.